



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,874	08/25/2003	Vernon M. Williams	*2209-4209.2US (99-0174.0)	3191
24247	7590	06/13/2005	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			ANDUJAR, LEONARDO	
			ART UNIT	PAPER NUMBER

2826

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/647,874	Applicant(s) WILLIAMS ET AL.	
	Examiner Leonardo Andújar	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>05/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Acknowledgment***

1. The amendment filed on 03/24/2005 in response to the Office action mailed on 12/22/2004 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-17.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 6, 9 and 11-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Batchelder (US 6,019,165).

4. Regarding claim 1, Batchelder (e.g. fig. 1) shows a heat sink for assembly with a semiconductor device component 10, comprising: a heat transfer element configured to be secure to a semiconductor device component and including at least one non linear passageway 50 including an internally confined portion extending along a non linear path though the heat transfer element.

5. Regarding claims 2, 3 and 4, Batchelder teaches that the at least a portion of the heat transfer element comprise a plurality of adjacent, mutually adhered regions

Art Unit: 2826

comprising thermally conductive material. Note that the spreader plate 20 and/or the fins 28 are adjacent and mutually adhered which are made of metal such as copper or aluminum (see e.g. fig. 7, col. 4/lls. 42-47 & col. 7/lls. 16-20).

6. Regarding claim 6, Batchelder it is inherent that the heat transfer element comprises a plurality of particles that are secure to one another since a metal material in its solid state comprises grains or particles that are secured to one another forming a rigid or solid structure.

7. Regarding claim 12, Batchelder shows that the passageway is configured to permit airflow therethrough (col. 9/lls. 45-49).

8. Regarding claims 13, 14, 15 and 17, Batchelder shows that a heat dissipation element or fins 28 adjacent to the heat transfer element and extending to a location remote from the semiconductor device component wherein dissipation element comprises a plurality of adjacent, mutually adhered regions and/or layers comprising thermally conductive material (see figure 6 & col. 7/lls. 16-20).

9. Regarding claims 16, 9 and 11, Batchelder shows a plurality of adjacent mutually adhered regions (e.g. 28) comprising a plurality of superposed, contiguous, mutually adhered layers (e.g. fins) made of a conductive material and thermally bonded by welding (see figure 6 & col. 7/lls. 14-20).

### ***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder (US 6,019,165) in view of Tseng (US 6,175,497).

13. Regarding claim 5, Batchelder r shows most aspect of the instant invention including a heat sink comprising copper (col. 4/lls. 42-47 & col. 7/lls. 16-20). Batchelder does not teach that the heat sink may comprise a ceramic or glass. Nevertheless, Tseng teaches that heat sinks can be made of ceramic (col. 3/lls. 62-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the heat sink disclosed by Batchelder of ceramic as taught by Schneider in order to reduce the device manufacturing cost.

14. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder (US 6,019,165) in view of Rostoker et al. (US 5,814,536).

15. Regarding claims 7 and 8, Batchelder teaches most aspects of the instant invention except for a method of making heat transfer element such as a plurality of

particles that are secured to one another with a binder and/or sintering. Nevertheless, Rostoker teaches that a thermally conductive material for a heat sink can be made by securing together a plurality of conductive particles with a binder and/or by sintering. A good thermal conductivity and a suitable heat transfer efficiency between the heat transfer element layers can be obtained by the use of sintering and/or a binder (col. 4/lls. 33-45 & col. 8/lls. 60-67). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make heat transfer element disclosed by Batchelder by securing together a plurality of conductive particles with a binder and/or by sintering to obtain a suitable heat transfer efficiency and a good thermal conductivity as taught by Rostoker.

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder (US 6,019,165) in view of Fuller et al. (US 5,529,379)

17. Regarding claim 10, Batchelder shows most aspects of the instant invention except for adjacent sheets 20/28 secured together with an adhesive. Nevertheless, Fuller teaches that a heat transfer element (e.g. fig. 1) comprised by a plurality of adjacent mutually adhered regions (2-4 & 6) secured together with an adhesive 15 (col. 3/lls. 23-27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to secure the adjacent sheets disclosed by Batchelder using an adhesive in accordance to Fuller's invention to provide an enhanced adhesion and to ensure the physical and mechanical integrity of the heat element.

***Response to Arguments***

18. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

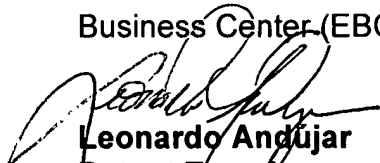
***Conclusion***

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from

Art Unit: 2826

the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Leonardo Andujar**  
**Patent Examiner**  
**Art Unit 2826**  
06/08/2005